

Measurement and Empirics of Structural Change in an Input-Output Framework

Topic: Input-Output Analysis: Employment policies (2)

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The emphasis on digital over physical outputs, pervasive in conceptualising new technologies, echoes the divide between material and immaterial (or intangible) products, prominent in decades-long discussions on the transition towards a “service economy”TM (Walker 1985). Material production was associated with manufacturing, whereas immaterial output with services. Hence, the increasing share of services in (nominal) value added and employment suggested that the economy was gradually “dematerialising”TM as it was “deindustrialising”TM (in relative terms).

At least three research questions emerge from these discussions:

(i) First, the need to empirically measure the changing sectoral income, output and employment shares in the economy. Following Baumol (2001), stylised facts of service industries imply rising costs (and prices), rising share in nominal income and employment and broadly constant share in real output. To what extent do these trends still hold if sectoral boundaries become increasingly blurred? And what may plausibly explain when such trends fail to hold?

(ii) Second, the need to understand the interaction between manufacturing and services in the process of structural transformation. In particular, by adopting a vertically integrated perspective (Pasinetti, 1973), we compute total (direct and indirect) manufacturing input requirements of services' final output, and vice-versa, to assess how industry interdependencies change through time.

(iii) Third, and finally, the need to quantify whether the interplay between final demand and productivity dynamics leads to technological unemployment, as the economy undergoes structural change. Following Pasinetti (1981), we logically repartition the economy into (relatively) autonomous subsystems, aiming to answer: to what extent has employment creation due to final demand expansion offset employment destruction due to labour productivity growth?

Hence, the aim of this paper is to shed light on these three inter-related research questions. In order to do so, we combine the OECD I-O country-level tables (2025 Release) with the OECD Structural Analysis (STAN) database, to obtain a unified I-O dataset with socio-economic accounts on employment, fixed capital and gross output price indices, covering the 1995-2022 period.

For each of the three research questions (i)-(iii) above, novelty lies in mutisectoral awareness, which provides conceptual accuracy when compared to traditional, industry-level analyses.

In particular, as regards (i), rather than adopting real value added -- which is a residual magnitude that does not admit an intrinsic price/volume separation (UN, 2009) -- we consider final output in constant prices of an I-O expenditure system, in order to assess structural trends in real final output.

In relation to (ii), rather than statistically assessing the strength and direction of the comovement between industry value added indicators, we model sectoral interdependence as a theoretical, ex-ante, feature of the economy, in order to capture the different roles that industries have in integrated value chains.

Finally, as regards (iii), the novelty lies in relating subsystem trends on technological unemployment

to the changing composition of sectoral shares in (i), in order to connect Baumol's cost disease with Pasinetti's structural dynamics, both analytically and empirically.

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